



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/552,191	06/30/2006	Nobuo Kushibiki	71,051-021	8417

27305 7590 04/28/2009
HOWARD & HOWARD ATTORNEYS PLLC
450 West Fourth Street
Royal Oak, MI 48067

EXAMINER

NELSON, MICHAEL B

ART UNIT	PAPER NUMBER
----------	--------------

1794

MAIL DATE	DELIVERY MODE
-----------	---------------

04/28/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/552,191	Applicant(s) KUSHIBIKI ET AL.	
	Examiner MICHAEL B. NELSON	Art Unit 1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 February 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 4,5 and 8-25 is/are pending in the application.
- 4a) Of the above claim(s) 13-17 and 19-23 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 4, 5, 8-12, 18, 24 and 25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 02/27/09 has been entered. Claims 4, 5, 8-12, 18, 24 and 25 are under examination on the merits.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 4, 5, 8-12, 18, 24 and 25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 4 and 5 recite the phrase "per molecule" in describing the amount of monovalent unsaturated aliphatic hydrocarbon groups and silicon-bonded hydrogen atoms and other chemical components however it is unclear what it considered the molecule in question (i.e. the monomer being polymerized or the entire final polymerized molecule).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are

Art Unit: 1794

such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 4, 5, 8-12, 18, 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Birdsall et al. (U.S. 4,198,131) in view of Amano et al. (U.S. 5,672,672).

7. Regarding claims 4, 5, 24 and 25, Birdsall et al. discloses a curable polysiloxane composition which includes a base resin, (i.e. instant component A), of methylvinylphenylpolysiloxane (Example 1, Base resin (I), C5, L50-56). The relative amount of phenylsiloxane to methylvinylsiloxane is shown as being 75:25 (Table II, Example A), which reads on the instant ranges. It would have been obvious to one having ordinary skill in the art to have adjusted the degree of polymerization (i.e. the average molecular weight) of the base resin in order to optimize the hardness (i.e. durometer property, Table III) of the final resin while still maintaining sufficient flow characteristics (i.e. melting point) to enable easy molding before being cured (i.e. liquid under 100 degree Celsius, C3, L55-60). The polymerization of the monomers would result in more than three vinyl groups being present in the overall polymer molecule.

8. Base resin (I) is also disclosed as containing a phenylmethylvinylsiloxane diluent (C5, L56), which is earlier disclosed as being a low molecular weight polysiloxane (i.e. oligomer)

Art Unit: 1794

having a low viscosity (C2, L60-65). Given the teaching of Birdsall et al. towards the characteristics of the diluent it would have been obvious to one having ordinary skill in the art to have adjusted the molecular weight (i.e the amount of Si in the overall polymer molecules) in order to sufficiently reduce the viscosity of the diluent to achieve the taught diluting effects.

9. The base resin (I) of Birdsall et al. is disclosed as being mixed with a crosslinking agent which is a methylphenylhydrosiloxane resin (i.e. instant component B) (C6, L1-5). The amount of methylhydrosiloxane in the compound would result in more than two silicone bonded hydrogens in the final polymer molecule.

Birdsall et al. does not specifically disclose the use of the polysiloxane based resin composition as being used with waveguides, even though its optical use is disclose (See Abstract).

Amano et al. discloses a polysiloxane based resin composition which is used in a waveguide application (See Abstract, and Fig. 1 and 2). The use of a polysiloxane resin blend is disclosed as being particularly advantageous due to the ability to control the relative refractive indexes of the materials in core and clad parts of the waveguide through controlling the relative weight percentages of the constituents in the blend for each material (C22, L50-65). Controlling the aromatic group content in each blend is specifically disclosed as one such refractive index effecting factor (C19, L55-65). The polysiloxane blend of Birdsall et al. would be a particularly good blend to use in the manner as taught by Amano et al. (i.e. controlling the refractive index of the blend to make core and clad components of a waveguide) because of its high mechanical strength (C5, L30-45).

Art Unit: 1794

The inventions of both Birdsall et al. and Amano et al. are drawn to the field of optical polysiloxane resin compositions and therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to have used the resin composition of Birdsall et al. as a waveguide material as taught by Amano et al. for the purposes of imparting increase commercial applicability to the invention.

Regarding claims 8-12 and 18, modified Birdsall et al. discloses all of the limitations as set forth above. Additionally, Amano et al. discloses a waveguide made from a polysiloxane resin composition in which the core and the clad structural components are made of the same general resin with different relative amounts of components (Example 2, C22, L20-C23, L25). Amano et al. also discloses that the controlling of the refractive index of the two structural components (core and clad) may be adjusted by, inter alia adjusting the amount of aromatic group containing polysiloxane components in the overall resin composition (C19, L40-65). Furthermore, having knowledge that aromatic group containing polysiloxane compounds have a different index of refraction than non-aromatic containing polysiloxane compounds, one having ordinary skill would adjust the relative amounts of these materials in a blend in order to "fine-tune" and optimize the refractive index of the overall blend. The waveguide of Amano et al. is also a film type wave guide, (Fig. 1 and 2, and Example 2, C22, L20-C23, L25).

Response to Arguments

10. Applicant's arguments filed on 02/27/09 are considered moot in light of the new grounds of rejection which were necessitated by applicant's amendments. Arguments which are still deemed to be relevant are addressed below.

Art Unit: 1794

11. Applicant argues against the use of Amano et al. as a teaching reference for the waveguide application of optical polysiloxane resins in general. The examiner disagrees. Applicant argues that there is no reasonable expectation that polysiloxane resins would resist intermixing to a degree to be formed into functional waveguides; however, the fact that the compositions of Amano et al. and Birdsall et al. are both cross-linked via, inter alia, silane crosslinkers, (See Abstract of Amano et al.) would lead one having ordinary skill in the art to expect that polysiloxane resins which are cured and set as in Amano et al. would not intermix after curing and would be formable into waveguides. Also, the examiner does not agree that improved mechanical strength would not be a beneficial property for waveguides.

Conclusion

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL B. NELSON whose telephone number is (571) 270-3877. The examiner can normally be reached on Monday through Thursday 6AM-4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Sample can be reached on (571) 272-1376. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1794

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/David R. Sample/
Supervisory Patent Examiner, Art Unit 1794

/MN/
03/18/09